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near extremal value in a spectrum of the change in ratio of the reflectance of the measurement light is calculated in said step of calculating the change in ratio of the reflectance.

REMARKS

I. Introduction

In response to the pending Office Action, Applicants have cancelled claims 38-40 and 69-72, without prejudice, and amended claims 41-48, 50-53, 62, 68, 73-78, 80-82, 84-87, 90, 95, 97-100, 103, 104, 108, 111, 113-116, 119, 120, 127, 128 and 137. More specifically, each of claims 41-48, 73-78 and 80-82 have been rewritten in independent format including all of the limitations of the underlying base claim. The remaining claims have been amended to address the rejection thereof under 35 U.S.C. § 112, second paragraph. No new matter has been added.

For the reasons set forth below, Applicants respectfully submit that the application is now in condition for allowance.

II. The Rejection Of Claims 38-140 Under 35 U.S.C. § 112, Second Paragraph

Claims 38-140 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the present invention. In particular, the use of the phrase "a change rate" was objected to, as was the use of the term "predetermined".

First, the foregoing amendments to the claims have replaced the phrase "a change rate..." to "a rate of change of a ratio ..." in accordance with the Examiner's suggestion. As such, it is respectfully submitted that this aspect of the pending rejection has been overcome.

Second, with regard to the use of the term "predetermined" as set forth in claims 76, 103 and 119, it is respectfully submitted that the use of the term does not render the claim indefinite. Often times terms such as "predetermined" and "predefined" are utilized in claims to represent a desired operating condition that can vary based on the given application or operating conditions. It is improper to require the Applicants to unduly limit the claim by quantifying, for example, a desired range that is variable. In the instant claims, the acceptable ratio of reflectance is predetermined based on the electrical properties of the semiconductor region being acceptable (i.e., proper). There is nothing ambiguous about the language, and one of skill in the art would readily understand the scope of the claims. Nothing more is required. Accordingly, it is respectfully submitted that the use of the term "predetermined" as set forth in the claims noted in the pending rejection does not render the claims indefinite or ambiguous in any manner.

For all of the foregoing reasons, it is respectfully submitted that all of the pending claims satisfy all requirements of 35 U.S.C. § 112, second paragraph.

III. The Rejection Of The Claims Based On Doubling Patenting

Claims 38-41, 45-52, 67, 96-99, 105-110, 112-118 and 121-126 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of USP No. 6,395,563. Applicants are submitting concurrently herewith a terminal disclaimer so as to overcome the double patenting rejection.

IV. Conclusion

Having fully and completely responded to the Office Action, Applicants submit that all of the claims are now in condition for allowance, an indication of which is respectfully solicited. If

there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 38-40 and 69-72 have been cancelled, without prejudice.

Claims 41-48, 50-53, 62, 68, 73-78, 80-82, 84-87, 90, 95, 97-100, 103, 104, 108, 111, 113-116, 119, 120, 127, 128 and 137 have been amended as follows:

41. (Amended) An optical evaluation method [according to claim 38,] for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a plasma etching process performed with respect to said semiconductor region.

42. (Amended) An optical evaluation method [according to claim 38,] for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a light dry etching process for removing a damaged layer caused by plasma etching performed with respect to said semiconductor region.

43. (Amended) An optical evaluation method [according to claim 38,] for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a process of introducing an impurity into said semiconductor region.

44. (Amended) An optical evaluation method [according to claim 38,] <u>for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:</u>

<u>supplying measurement light to the semiconductor region of said substrate in said chamber;</u>

<u>intermittently supplying exciting light to said semiconductor region; and</u>

<u>calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,</u>

wherein said processing is an annealing process performed after impurity ions are implanted in said semiconductor region.

45. (Amended) An optical evaluation method [according to claim 38,] <u>for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:</u>

<u>supplying measurement light to the semiconductor region of said substrate in said chamber;</u>

<u>intermittently supplying exciting light to said semiconductor region; and</u>

<u>calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,</u>

wherein said processing is a process of forming an insulating film on said semiconductor region.

46. (Amended) An optical evaluation method [according to claim 38,] <u>for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:</u>

<u>supplying measurement light to the semiconductor region of said substrate in said chamber;</u>

<u>intermittently supplying exciting light to said semiconductor region; and</u>

<u>calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,</u>

wherein said processing is a dry etching process for removing an insulating film from a top surface of said semiconductor region.

47. (Amended) An optical evaluation method [according to claim 38,] <u>for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:</u>

<u>supplying measurement light to the semiconductor region of said substrate in said chamber;</u>

<u>intermittently supplying exciting light to said semiconductor region; and</u>

calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said semiconductor region is composed of n-type silicon.

48. (Amended) An optical evaluation method [according to claim 38,] for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change of a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said exciting light is intermittently emitted at a frequency of 1 kHz or less in said step of supplying the exciting light.

50. (Amended) A method of manufacturing a semiconductor device according to claim 49, wherein said second step includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a <u>rate of change of a ratio</u> [change rate] of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

51. (Amended) A method of manufacturing a semiconductor device according to claim 50, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.

52. (Amended) A method of manufacturing a semiconductor device according to claim 51, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light of a wavelength of 300 to 600 nm is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.

53. (Amended) A method of manufacturing a semiconductor device according to claim 50, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change [rate] <u>in ratio</u> of the reflectance of the measurement light is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.

62. (Amended) A method of manufacturing a semiconductor device according to claim 50, said method further comprising, prior to said second step, the steps of:

introducing an impurity at a high concentration into said semiconductor region of said substrate and depositing an interlayer insulating film on said semiconductor region; and

selectively removing said interlayer insulating film by plasma etching to form an opening reaching said semiconductor region,

wherein said third step includes performing light dry etching with respect to the semiconductor region exposed at a bottom surface of said opening to remove a damaged layer caused by said plasma etching and predetermining a proper range of the change [rate] <u>in ratio</u> of the reflectance of said measurement light when an electric property of the semiconductor region is proper and

said fourth step includes performing said light dry etching such that said change [rate] <u>in ratio</u> of the reflectance falls within said proper range.

68. (Amended) A method of manufacturing a semiconductor device according to claim 50, wherein said second step includes evaluating the change [rate] <u>in ratio</u> of the reflectance of measurement light by using an ellipsometric-spectroscope.

73. (Amended) A method of manufacturing a semiconductor device [according to claim 70] <u>having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:</u>

<u>evaluating an optical property of said semiconductor region; and</u>

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein the change [rate] in ratio of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change [rate] in ratio of the reflectance.

74. (Amended) A method of manufacturing a semiconductor device [according to claim 71] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein the change in ratio of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change in ratio of the reflectance and said specified energy value of the measurement light is any value included in a range of 3.2 to 3.6 eV.

75. (Amended) A method of manufacturing a semiconductor device [according to claim 70] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the

presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said exciting light is intermittently emitted at a frequency of 1 kHz or less in said step of supplying the exciting light.

76. (Amended) A method of manufacturing a semiconductor device [according to claim 70] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein a proper range of the change [rate] in ratio of the reflectance of said measurement light when an electric property of the semiconductor region is proper is predetermined, and

said heat treatment is performed in said step of performing the heat treatment with respect to the semiconductor region such that the change [rate] in ratio of the reflectance of said measurement light falls within said proper range.

77. (Amended) A method of manufacturing a semiconductor device [according to claim 70] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein a relationship between the change [rate] in ratio of the reflectance of the measurement light in said semiconductor region and an impurity concentration in said semiconductor region is predetermined, and

the heat treatment is performed with respect to said semiconductor device in said step of performing the heat treatment till the change [rate] in ratio of the reflectance of the measurement

light in said semiconductor region reaches a value corresponding to a desired impurity concentration.

78. (Amended) A method of manufacturing a semiconductor device [according to claim 69] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

wherein a first semiconductor region forming a part of a semiconductor element and a second semiconductor region to be subjected to optical evaluation are preliminarily formed as said semiconductor region,

the optical property of said second semiconductor region is evaluated in said step of evaluating the optical property, and

said first and second semiconductor regions are simultaneously subjected to the heat treatment in said step of performing the heat treatment, while a condition for said heat treatment is controlled based on the result of evaluating the optical property of said second semiconductor region.

80. (Amended) A method of manufacturing a semiconductor device [according to claim 69] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

wherein a portion of said semiconductor region to be subjected to optical evaluation is composed of n-type silicon.

81. (Amended) A method of manufacturing a semiconductor device [according to claim 69] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

wherein a portion of said semiconductor region to be subjected to optical evaluation is composed of n-type silicon.

82. (Amended) A method of manufacturing a semiconductor device [according to claim 70] having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said second step includes evaluating the change [rate] in ratio of the reflectance of the measurement light by using an ellipsometric spectroscope.

84. (Amended) A method of manufacturing a semiconductor device according to claim 83, wherein said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a [change] rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

85. (Amended) A method of manufacturing a semiconductor device according to claim 84, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.

86. (Amended) A method of manufacturing a semiconductor device according to claim 85, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light of a wavelength of 300 to 600 nm is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.

87. (Amended) A method of manufacturing a semiconductor device according to claim 84, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.

90. (Amended) A method of manufacturing a semiconductor device according to claim 84, wherein:

a relationship between an amount of introduced impurity and the change [rate] <u>in ratio</u> of the reflectance of said measurement light is predetermined by experiment, and

said impurity is introduced in said step of introducing the impurity into said semiconductor region such that the change [rate] <u>in ratio</u> of the reflectance of said measurement light reaches a value corresponding to a desired amount of introduced impurity.

95. (Amended) A method of manufacturing a semiconductor device according to claim 84, wherein said second step includes evaluating the change [rate] in ratio of the reflectance of the measurement light by using an ellipsometric spectroscope.

97. (Amended) A method of manufacturing a semiconductor device according to claim 96, wherein said second step includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a [change] rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

98. (Amended) A method of manufacturing a semiconductor device according to claim 97, wherein the change [rate] in ratio of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change [rate] in ratio of the reflectance.

99. (Amended) A method of manufacturing a semiconductor device according to claim 98, wherein the change [rate] in ratio of the reflectance of the measurement light of a wavelength of 300 to 600 nm is calculated in said step of calculating the change [rate] in ratio of the reflectance.

100. (Amended) A method of manufacturing a semiconductor device according to claim 97, wherein the change [rate] in ratio of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change [rate] in ratio of the reflectance.

103. (Amended) A method of manufacturing a semiconductor device according to claim 97, wherein:

a proper range of the change [rate] in ratio of the reflectance of the measurement light when an electric property of the insulating film is proper is predetermined by experiment, and

said fourth step includes forming the insulating film such that the change [rate] in ratio of the reflectance of the measurement light measured in said second step falls within said proper range.

104. (Amended) A method of manufacturing a semiconductor device according to claim 97, wherein:

said second step includes measuring the change [rate] in ratio of the reflectance of the measurement light in the semiconductor region before said insulating film is formed thereon, and

said fourth step includes controlling a condition for the formation of the insulating film by remeasuring the change [rate] in ratio of the reflectance of the measurement light in said semiconductor region which varies with the progression of the formation of the insulating film

and comparing a result of remeasurement with a result of measurement performed in said second step.

108. (Amended) A method of manufacturing a semiconductor device according to claim 97, said method further comprising, after said fourth step, the step of:

judging the formed insulating film to be good or no good based on a relationship predetermined by experiment between the change [rate] in ratio of the reflectance of said measurement light and an electric property of the insulating film.

111. (Amended) A method of manufacturing a semiconductor device according to claim 97, wherein said second step includes evaluating the change [rate] in ratio of the reflectance of the measurement light by using an ellipsometric spectroscope.

113. (Amended) A method of manufacturing a semiconductor device according to claim 112, wherein said second step includes the steps of:

supplying measurement light to said semiconductor region through said insulating film;

intermittently supplying exciting light to said semiconductor region through said insulating film; and

calculating a [change] rate of change in a ratio of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

114. (Amended) A method of manufacturing. a semiconductor device according to claim 113, wherein the change [rate] in ratio of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change [rate] in ratio of the reflectance.

115. (Amended) A method of manufacturing a semiconductor device according to claim 114, wherein the change [rate] in ratio of the reflectance of the measurement light of a wavelength of 300 to 600 run is calculated in said step of calculating the change [rate] in ratio of the reflectance.

116. (Amended) A method of manufacturing a semiconductor device according to claim 113, wherein the change [rate] in ratio of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change [rate] in ratio of the reflectance of the measurement light is calculated in said step of calculating the change [rate] in ratio of the reflectance.

119. (Amended) A method of manufacturing a semiconductor device according to claim 113, wherein:

a proper range of the change [rate] in ratio of the reflectance of the measurement light when the removal of said insulating is properly completed is predetermined, and

said fourth step includes performing dry etching with respect to the insulating film such that the change [rate] in ratio of the reflectance of the measurement light measured in said second step falls within said proper range.

120. (Amended) A method of manufacturing a semiconductor device according to claim 113, wherein:

said second step includes measuring the change [rate] in ratio of the reflectance of the measurement light in the semiconductor region when said insulating film is formed thereon, and

said fourth step includes controlling a condition for the removal of the insulating film by remeasuring the change [rate] in ratio of the reflectance of the measurement light in said semiconductor region which varies with the progression of the removal of the insulating film and comparing a result of remeasurement with a result of measurement performed in said second step.

127. (Amended) A method of manufacturing a semiconductor device according to claim 113, wherein said second step includes evaluating the change [rate] in ratio of the reflectance of the measurement light by using an ellipsometric spectroscope.

128. (Amended) A method of controlling an apparatus for manufacturing a semiconductor device comprising a chamber for containing a substrate having a semiconductor region, processing means for performing processing with respect to said substrate in said chamber, first light supplying means for intermittently supplying exciting light to the semiconductor region of said substrate placed in said chamber, a second light supplying means for supplying measurement light to said semiconductor region, and reflectance measuring means for measuring a reflectance of the measurement light supplied to said semiconductor region, said method comprising :

a first step of supplying the measurement light to said semiconductor region;

a second step of intermittently supplying the exciting light to said semiconductor region;

a third step of calculating a [change] rate <u>of change of a ratio</u> of the reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light;

a fourth step of operating said processing means for a specified time till the change rate of the reflectance calculated in said third step reaches a specified value; and

a fifth step of monitoring said specified time in said fourth step and outputting a signal for causing maintenance to be performed with respect to said apparatus for manufacturing the semiconductor device when said specified time exceeds a limit value.

137. (Amended) A method of controlling an apparatus for manufacturing a semiconductor device according to claim 128, wherein the change [rate] <u>in ratio</u> of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change [rate] <u>in ratio</u> of the reflectance of the measurement light is calculated in said step of calculating the change [rate] <u>in ratio</u> of the reflectance.